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ABSTRACT

This two-part publication describes techniques and approaches that many California school districts are using successfully to involve staff and students in efforts to reduce energy waste. Topics that are covered include: (1) ideas for generating student and staff awareness of the cost of energy waste and their role in reducing it; (2) specific actions that staff and students can take to save energy; (3) recommendations on the content, format, and organization of staff development programs; and (4) strategies for communicating energy issues and activities district-wide. Part one discusses how to motivate staff to save energy (including ways to communicate energy costs to staff and actions that staff can take) and how to motivate students to save energy and involve them in energy-saving activities. Part two provides guidelines for specific activities including contests, student energy patrols, staff development workshops, and energy committees. Also included are brief program descriptions for 15 of the 21 California school districts that received Energy Action in Schools (EAIS) funds to develop model energy education and energy management programs. (DC)

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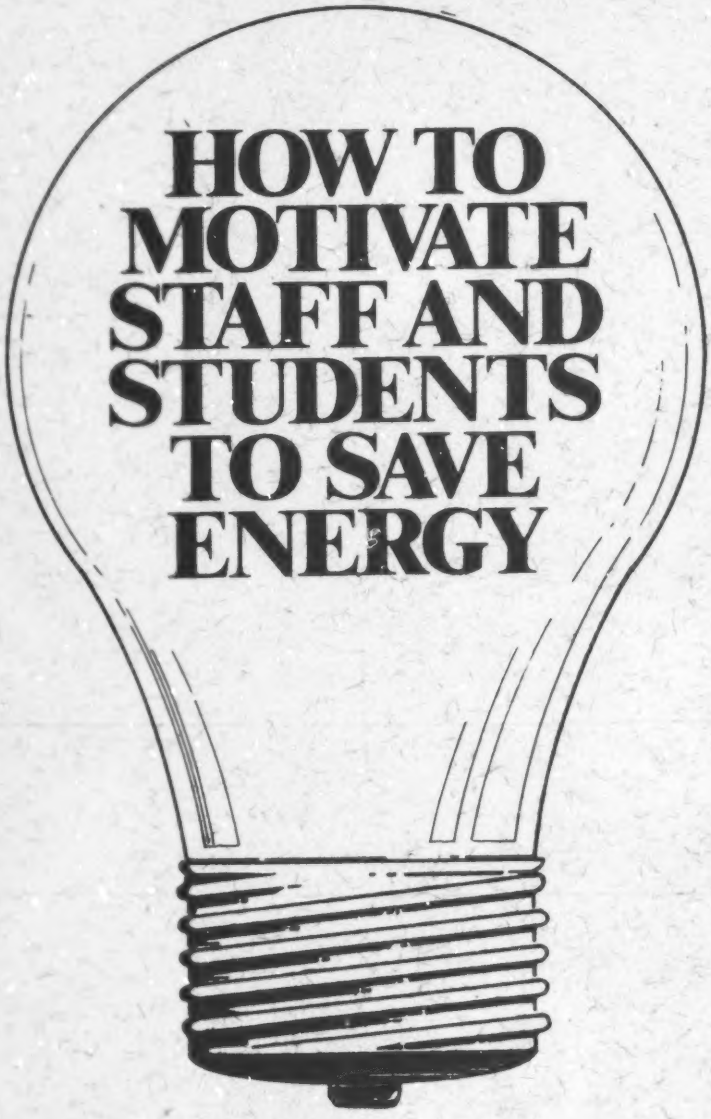
HOW TO MOTIVATE STAFF AND STUDENTS TO SAVE ENERGY



A Guide to Methods and Techniques That Work

California Energy Extension Service

Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814
George Deukmejian, Governor

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Energy Action in Schools Program
of the
California Energy Extension Service

Governor's Office of Planning and Research
George Deukmejian, Governor

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Additional copies may be ordered from the California Energy Extension Service, 1400 Tenth Street, Sacramento, CA 95814. Other documents you may be interested in are *Animated Bibliography: A Sampler of Energy Education Materials, Energy Reports: Organizing and Communicating Your Energy Data*, and *Developing an Energy Action in Schools Program. If you have any questions about these or any other CEES documents, please contact us at (916) 323-4388.*

ACKNOWLEDGEMENTS

This guide would not have been possible without the cooperation of all those teachers, administrators, maintenance staff and students who operated model programs for the California Energy Extension Service in 1981 and 1982. This guide reflects their talent and commonsense. In our attempt to collect their wisdom and compile it, it is inevitable that some of the good ideas would be overlooked, although their contributions could never be. To all of these 21 programs, we say thank you for the information and inspiration that you have given us.

NOTICE

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The California Energy Extension Service is an energy management action program of the Governor's Office of Planning and Research. CEES works with small businesses, local governments, school districts and community groups to develop programs that promote energy efficiency by providing direct, personalized services at the local level. Interested readers may receive updates on CEES program activities by subscribing to *SaveEnergy* which is distributed free of charge.

January 1984

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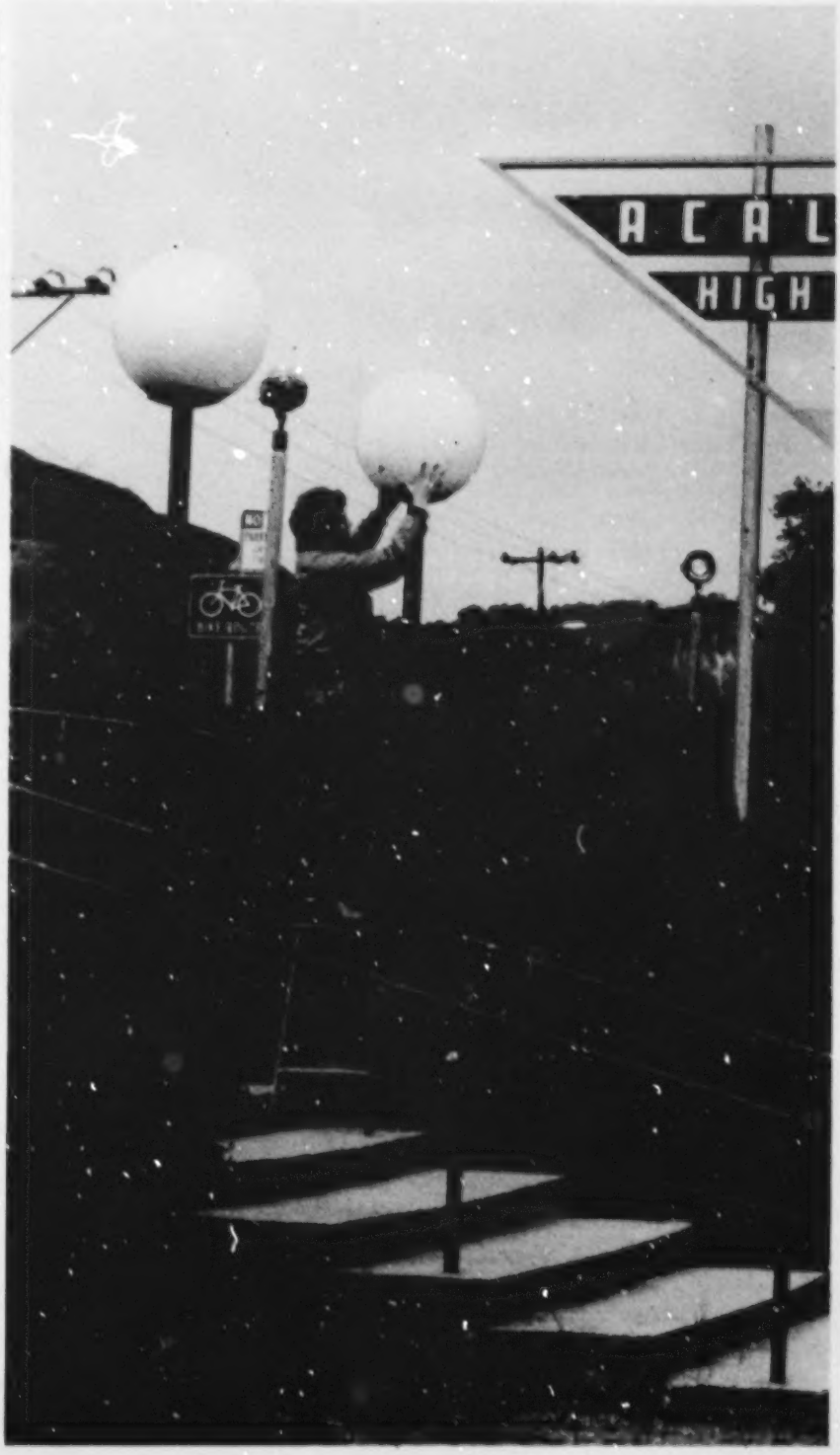
Introduction

Many school districts in California recognize that the obstacles to school energy management are often behavioral and institutional, not just technical. If your district understands that installing energy-efficient equipment is only a partial answer to its energy problems, and is asking "What can we do to gain the support of staff and students to reduce energy use?", then this publication may be just what you're looking for.

This publication describes techniques and approaches that many districts are successfully using to involve their staff and students in district-wide efforts to reduce energy waste. You will find:

- ideas for generating student and staff awareness of the costs of energy waste and their role in reducing it;
- specific actions that staff and students can take to save energy;
- recommendations on the content, format, and organization of staff development programs; and,
- strategies for communicating energy issues and activities district-wide.

The techniques and methods described in this publication are derived from the experiences of 21 school districts which received contract funds from the Energy Action In Schools Program of the California Energy Extension Service in 1981 and 1982. These districts (see listing on page 17) were funded to develop models of Comprehensive Energy Management Programs. Comprehensive energy management reduces energy waste through a combination of energy-conserving behavior and hardware. Using this approach, these districts have already saved $2.14 in energy costs for every state dollar invested, showing that comprehensive energy management is a sound investment for school districts.



Part One

I. How to Motivate Staff to Save Energy

A. COMMUNICATING WITH STAFF

"I used to leave the lights on in my classroom and the radio playing when I wasn't there, but I don't any more. I have developed some good habits as a result of the (energy) program." (teacher in Newcastle School District)

Staff cooperation and support start with effective communication. Administrators, teachers or certified staff typically do not know how much it costs for energy to operate the school, and are astonished by utility costs. An obvious way to heighten staff awareness of energy waste is to regularly communicate energy costs. How these costs are communicated can make the difference between staff being only mildly interested in saving energy or highly motivated to take an active role in conservation. The impact of energy waste comes to life when energy costs are expressed in numbers of teaching positions or textbooks instead of just dollars. What follows are suggestions for communicating energy use to staff in such a way that generates interest in changing wasteful habits.

---

1) DISCUSS ENERGY COSTS AND HOW TO REDUCE ENERGY WASTE AT STAFF MEETINGS

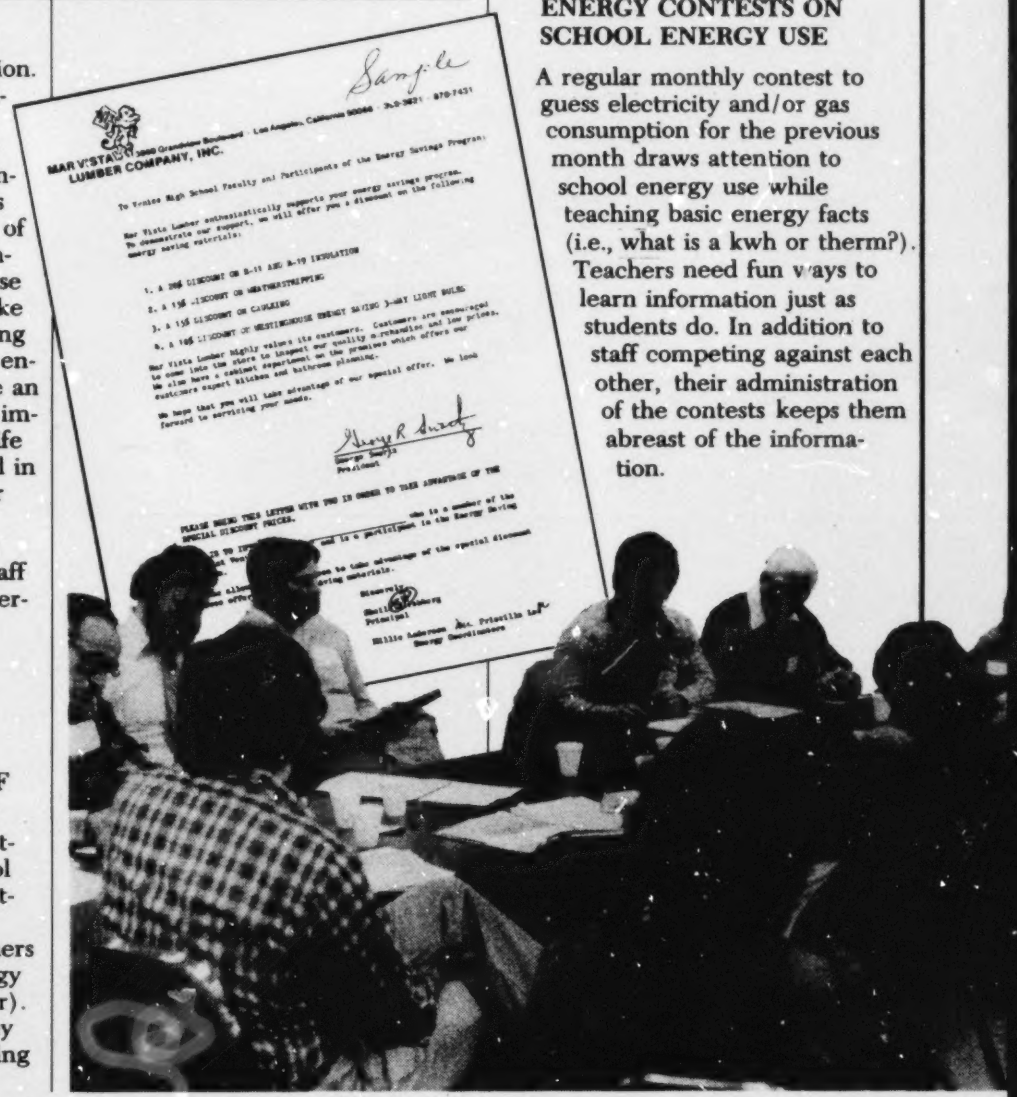
One high school had a staff meeting where home as well as school energy management was presented. Two teachers talked a local hardware store into giving teachers at the school a discount on energy conservation purchases (see flyer). The enthusiasm for saving money at home was carried over to saving energy and money at school.

2) DISPLAY LARGE CHARTS SHOWING ENERGY CONSUMPTION IN VISIBLE PLACES

Large charts showing gas and electrical savings can be displayed in conspicuous places such as the cafeteria or a hallway. A class or club can take responsibility for keeping the monthly therm and kwh consumption up to date. In some schools, students read the electric and gas meters daily and graph these numbers. Student interest and questions motivate staff to stay on top of this information.

3) CONDUCT MONTHLY ENERGY CONTESTS ON SCHOOL ENERGY USE

A regular monthly contest to guess electricity and/or gas consumption for the previous month draws attention to school energy use while teaching basic energy facts (i.e., what is a kwh or therm?). Teachers need fun ways to learn information just as students do. In addition to staff competing against each other, their administration of the contests keeps them abreast of the information.



B. ACTIONS STAFF CAN TAKE

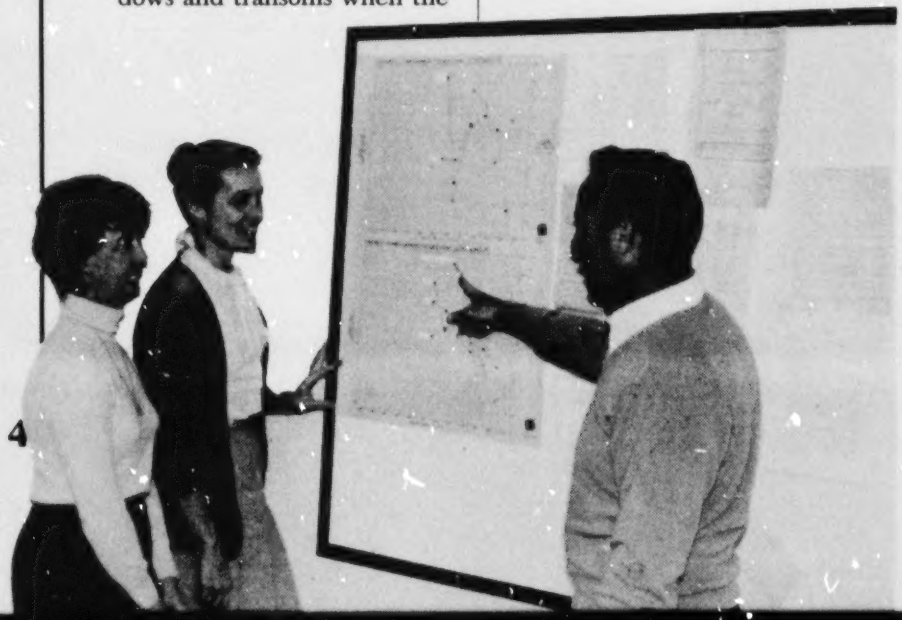
Once staff are aware of the impact of energy costs on the school's budget and are motivated to reduce energy waste, what opportunities do they have to become part of the solution? The most obvious energy actions to take are those related to creating and maintaining an energy efficient classroom and school environment. Following is a "laundry list" of some of those actions.

In the Classroom —

- Turn off lights when they aren't needed . . . i.e. whenever the classroom is unoccupied AND during classroom use when natural light levels are adequate.
- Use task lighting when working at your desk in an empty classroom, or only the lights above your desk.
- Keep windows and doors closed when the heater or air-conditioner is operating.
- Measure the room temperature with a thermometer to determine if the thermostat is functioning properly.
- Remove desks, bookcases, or filing cabinets that are placed in front of vents. Blocked vents prevent the room from being heated or cooled evenly.
- Keep hallway or exterior doors closed as well as windows and transoms when the heating or cooling systems are operating. Any opening to the outside becomes a major source of heat loss or heat gain.
- Infuse energy education into the curriculum.
- Sponsor contests in your classroom.

In the School —

- Ask the principal to obtain copies of your school energy bills from the district business or energy office to generate awareness.
- Graph the school's energy use in kwh and therms for the past school year to use as a comparison to this year's use.
- Find out if your school has had an energy audit by the local utility. If not, suggest that one be scheduled (there is no cost to the school).
- Organize a school energy committee that includes the principal, head custodian, interested teachers, classified staff, and students. The committee can monitor school energy use, set energy saving goals, and implement an energy saving plan (see Energy Committee, pg 14).
- Organize a student energy patrol at the elementary level (see Energy Patrol, pg 11), or a student energy commission at the secondary level to monitor school energy use
- Organize parent-student work parties to do such things as weatherstrip windows, wash flourescent light covers, etc.
- Organize an energy staff development program for classified and certificated staff (see Staff Development, pg 12).
- Communicate your school's energy saving successes to the community through school newsletters and the local media.
- Organize energy awareness contests (see Contests, pg 7).

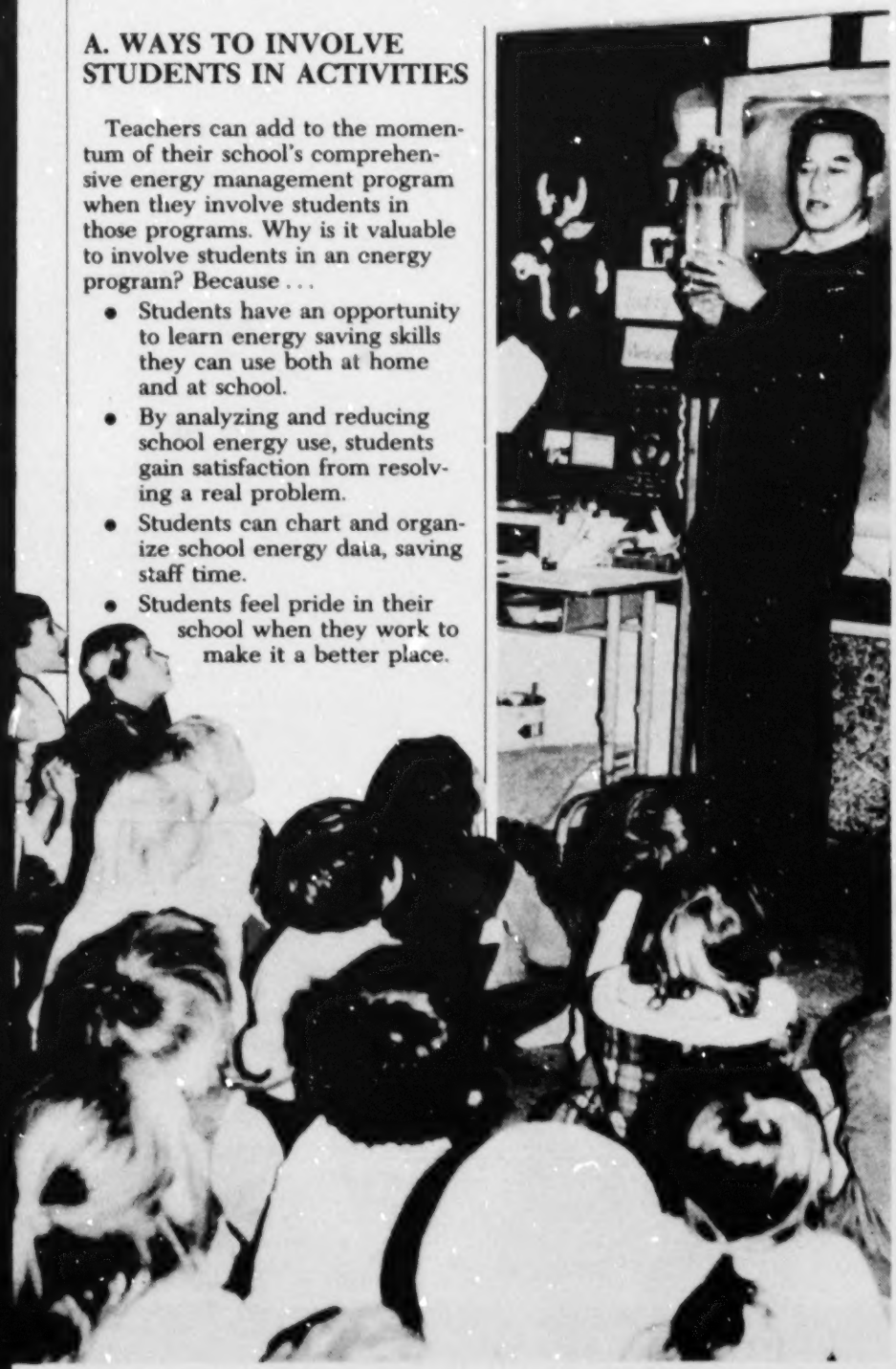


II. How to Motivate Students to Save Energy

A. WAYS TO INVOLVE STUDENTS IN ACTIVITIES

Teachers can add to the momentum of their school's comprehensive energy management program when they involve students in those programs. Why is it valuable to involve students in an energy program? Because . . .

- Students have an opportunity to learn energy saving skills they can use both at home and at school.
- By analyzing and reducing school energy use, students gain satisfaction from resolving a real problem.
- Students can chart and organize school energy data, saving staff time.
- Students feel pride in their school when they work to make it a better place.



- Since there are more students than staff, involving students creates many more energy savers.
- Staff are more likely to save energy when they are reminded by students.
- Students learn analytical skills of direct benefit to the community.

Teachers can encourage student enthusiasm and involvement in energy saving activities by:

- giving students a challenge;
- letting them know they *can* make a difference in energy costs;
- providing opportunities for recognition; and,
- sponsoring awareness activities such as contests, etc. (see Contests).

It is easier to involve and motivate elementary students in energy programs than high school students as younger students are more responsive to teacher praise and have fewer outside interests. However, it is possible and just as valuable to involve high school students. High school students can be challenged by more detailed energy detecting work, such as night time energy patrols, building energy retrofits and analyzing school utility bills. More specifics on activities for both primary and secondary students will be discussed in Part II of this publication.

High school students at Foothill High School in the East Side UHSD attended a Public Utility Commission hearing and discovered that their district had been overcharged one month. This happened because the utility read the school meter every other month. Towards the end of one two-month period, there was a major rate increase. The students discovered that the school had been charged at the higher rate for the entire two months. Since the students had recorded their meter readings every day during these two months, the bill was recalculated using the student readings and the district saved a substantial amount of money.

B. HOW CAN STUDENTS GET INVOLVED?

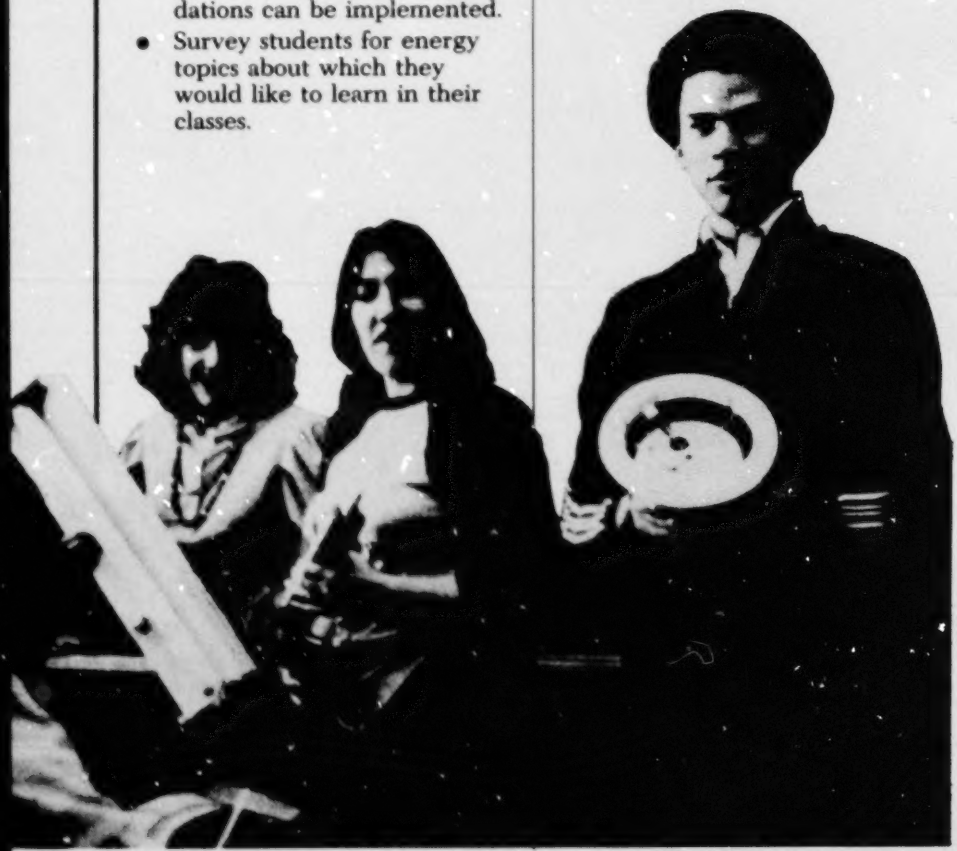
Once you motivate students to become involved, you need to give them a number of opportunities to become involved. You need to be sure that they are recognized for their involvement and let them know they can make a difference. Below you will find a variety of activities for different types of students. You can . . .

Involve the entire student body —

- Appoint or elect a student energy commissioner to monitor school energy use and organize a student energy task force.
- Survey the principal, head custodian, and department heads to determine the technical and educational steps taken by the school to reduce energy use.
- If the school has had an energy audit, see what recommendations can be implemented.
- Survey students for energy topics about which they would like to learn in their classes.
- Schedule student body activities and functions with energy conservation in mind.
- Organize a student carpooling board.

Give students the lead in communication —

- By the school entrance, post school energy costs per month or year.
- Obtain the school energy bills each month and have students graph energy use compared to the previous year.
- Put energy conservation tips in the school bulletin and newspaper.
- Write articles about your school energy conservation efforts for local newspapers.
- Invite local media to attend your school's energy activities.
- Put out a suggestion box for energy saving ideas.



- Schedule students from the energy class to make presentations to other classes.

Link students with school staff —

- Check with your district energy manager or the head of maintenance to borrow light meters and survey whether the lighting intensities are matched to work activities.
- Appoint an energy monitor for each room.
- Conduct an energy patrol to turn off lights in empty rooms.
- Conduct a night raid to see if lights are left on in the school during the night.
- Calibrate the thermostats with a thermometer to see if the readings are the same.
- Chart room temperatures during various times of the day and give the information to the energy manager for analysis.
- Recommend to your administrators that they adopt an incentives or recognition program to get everyone involved.
- Make recommendations for landscaping that will provide shade on southern and western walls.
- Wash fluorescent light covers to increase lighting efficiency.
- Make a map of the switches and timers in the school.
- Make an energy calendar with recommendations suggested by the district energy manager for actions teachers and students can take to reduce school energy use during weekends and vacations.

Create student awareness through assemblies —

- Sponsor an energy week with an energy fair, energy speakers, energy contests (see Contests) and energy activities in classes.
- Contact utilities, other school districts and the city energy office for speakers, resources, or films.

Part Two
Specific Activities

In the previous section, we introduced certain activities and put them in context for you. In this section, you will find more specifics for involving students and staff. As mentioned previously, these specifics are based on actual experiences of the 21 school districts which received contract funds. For students, we are highlighting contests and energy patrols. For staff, we are highlighting staff development. Both staff and students can be involved in site energy committees.

I. Contests

Contests are a fun way to draw the attention of both staff and students to energy conservation. There are two basic types of contests:

- **Project-type** contests where students create a product such as a poster, limerick, or essay. (Time Frame: long)
- **Quiz-type** contests where participants complete a crossword puzzle, do a word search, or estimate the school's energy use. (Time Frame: short)

Before organizing either type of contest, you should give some thought to your goals and constraints. Some critical areas are organizing strategies, judging, and prizes.

Organizing Strategies —

Allow students to plan and run contests with adult guidance.

Students should compete with other students at their grade level, particularly if the contest is difficult.

Involve staff in contests, where they compete against one another.

Do not schedule contests at times when other drives are going on. The best times for "projects" to end appear to be back-to-school night, open house, or public schools' week so that results can be displayed prominently.

Distribute quiz-type contest on Mondays because that is the most likely day when classes will have some free time. Announce winners on Fridays.

Prizes —

Give everyone who enters quiz contests some type of prize — such as a button or sticker.

In an elementary school, give a prize either to one student in every classroom or grade level.

Project contest prizes are generally plaques, medallions, or monetary awards.

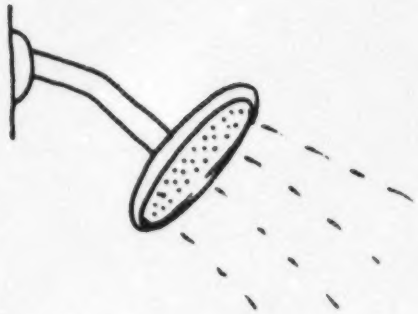
Quiz-type prizes are theater tickets, record albums, movie poster, t- shirts, or gift certificates. Ask local businesses to donate prizes to support your energy-saving efforts.

With project contests, the award ceremony is generally much more elaborate; often a luncheon before outside groups or a presentation at a board meeting or city council meeting. Much publicity is given to the winners and the projects are usually displayed prominently in some public place such as the district office, a shopping mall or city hall.

Judges —

Since students spend a good deal of time on projects, these contests generally have "prestigious" judges such as favorite high school or college athletes, local sports team favorite, TV or radio personality, principal, utility company representative, school board member, school site energy chairperson, class officer.

Examples of two word contests developed by EAIS model programs are featured on the following pages. The first is an excerpt from the *Energy Tech-Knowledgy Resource Guide* developed by Cupertino Union Elementary School District and available for K-6 grades. The second is from *Vinnie Meets the E.P.*, a coloring and storybook by students of Newcastle Elementary School. Teachers who desire more contest examples for all grade levels can contact CEES and request the *EAIS Contest Packet*.



NAME _____

EACH ALPHABET HAS A LETTER MISSING. WRITE THE MISSING LETTERS ON THE SPACES BELOW.

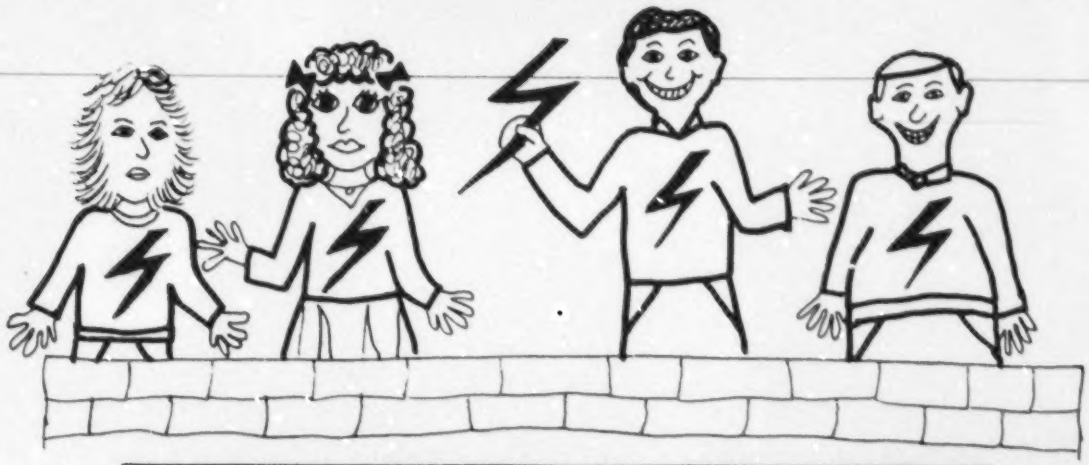
FIND OUT HOW YOU CAN SAVE ENERGY AT HOME.

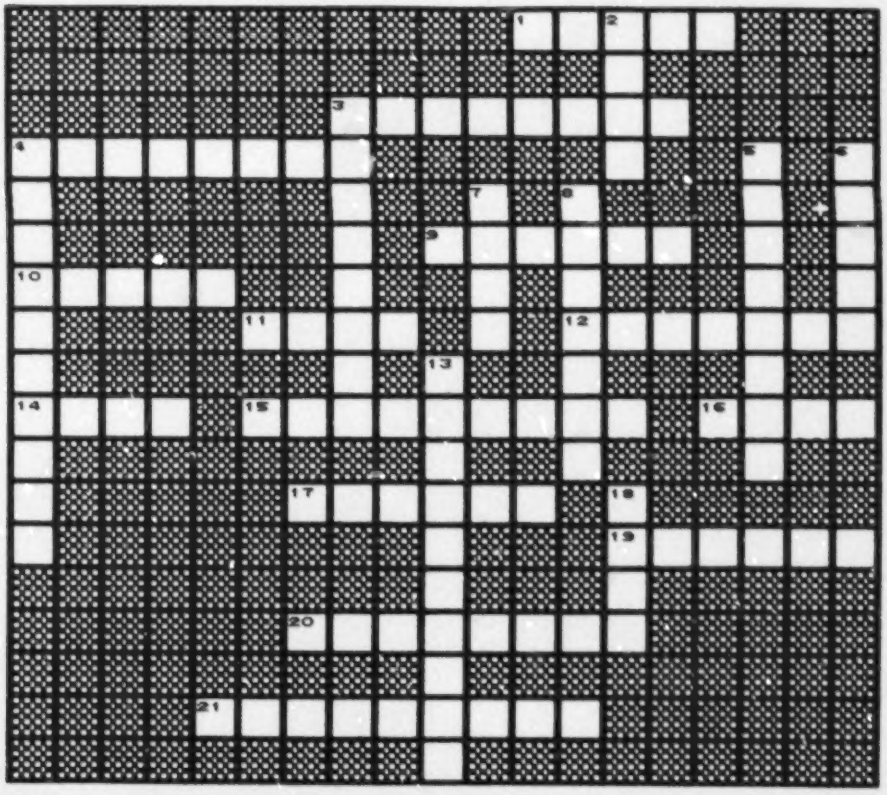
1. A B C D E F G H I J K L M _ O P Q R S _ V W X Y Z
2. B C D E F G H I J K L M _ O P Q R S T U V W X Y Z
3. A B C D E F G H I J L M _ O P Q R S T U V W X Y Z
4. A B C _ F G H I J K L M _ O P Q R S T _ V W X Y Z
5. A B C D E F G H I J K L M _ O P Q R T _ V W X Y Z
6. A _ C D E F G I J K L M _ O P Q R S T U V W X Y Z
7. A B C D E F G H I J K L M _ P Q R S T U V W X Y Z
8. A B C D E F G H I J K L M _ O P Q S T U V W X Y Z
9. A B C D E _ G H I J K L M _ O P Q R S _ V W X Y Z
10. A _ C D E F G H I J K L M _ O P Q R T U V W _ Y Z
11. A B C _ E F G I J K L M _ O P Q R S T U V W X Y Z
12. A _ C D E F G H I J K L M _ P Q R S T _ V W X Y Z
13. A B C _ E F G H I J K L M _ O P Q R S T U V X Y Z
14. A B C D F G H I J K L M _ O P Q R S T U V _ X Y Z
15. A B C D E F G H I J K L M N O P Q S T U V W X Y Z
16. A B C D E F G H I J K L M _ O P Q R T U V W X Y Z

ANSWER

1	2	3	4		5	6	7	8	9

10	11	12	13	14	15	16





ACROSS CLUES

1. FORCE OR ENERGY THAT CAN DO WORK
3. A GASOLINE SUBSTITUTE
4. A FUEL FOR MOTORIZED VEHICLES
9. A CONTANER USED TO MEASURE OIL
10. A MEASUREMENT FOR NATURAL GAS
11. A BLACK,SOLID SUBSTANCE FROM THE GROUND USED FOR FUEL
12. OF AN ATOM OR GROUP OF ATOMS
14. BEAMS OF LIGHT
15. AN OILY FLAMMABLE LIQUID THAT IN THE CRUDE STATE OFTEN HAS A BAD SMELL
16. AIR IN MOTION
17. ANY HARDENED SUBSTANCE FROM DINOSAURS OR PREHISTORIC PLANTS
19. POWER THAT MAKES THINGS GO
20. A UNIT OF POWER THAT IS EQUAL TO 1000 WATTS OR 1.34 HORSEPOWER
21. ARTIFICIAL,NOT REAL

DOWN CLUES

2. A HARD MATERIAL OF A TREE
3. 1,000,000 WATTS OR 1,000 KILO-WATTS
4. A SOURCE OF ENERGY FROM DEEP WITHIN THE EARTH
5. UNREFINED OIL (TWO WORDS)
6. OF OR HAVING TO DO WITH THE SUN
7. A UNIT FOR MEASURING ELECTRICITY
8. A RADIOACTIVE ELEMENT USED IN PRODUCING ATOMIC ENERGY
13. A POWER THAT A HORSE EXERTS IN PULLING
18. TO MAKE OR BECOME WARM OR HOT

9

With quiz contests, there may be so many correct entries that the actual winners are drawn from a lottery. The winner's picture might be displayed in an award case and announced in the school bulletin.

Students can correct quiz-type contests and draw the winner.

Many ideas for contests have been generated, although you may be able to think of many more. Contests, particularly projects, may be between schools, between classes at the same grade level or between grade levels. Particular types of projects may be more suited to particular subject areas.

- English: editorial on energy to be submitted to local papers.
- Art: logo for the energy committee.
- Physics: research paper on energy topics.
- Math: charts of energy use, estimates of savings potential.
- Social Studies: proposed energy legislation.
- Industrial Arts: designed energy-efficient structure.
- Computers: development of energy games or software.
- All: energy conservation limerick, poster, or light switch contests.

These quiz contests were developed at Venice High School in the Los Angeles Unified School District. Popular ideas include crossword puzzles and word searches. Elementary children might search for the energy wasters in a picture.

EXAMPLE:

CONDUCT MONTHLY ENERGY CONTESTS ON SCHOOL ENERGY USE

A regular monthly contest to guess electricity and/or gas consumption for the previous month draws attention to school energy use while teaching basic energy facts (i.e., what is a kwh or therm?). Teachers need fun ways to learn information just as students do. In addition to staff competing against each other, their administration of contests keeps them abreast of the information. At the elementary school, students in younger grades may need help from teachers with large numbers. When selecting the winners, ties may be a problem since younger students are inclined to guess very round numbers (e.g. 9,000 or 10,500). Teachers can remind them to make their guesses more like 9,849. In addition, it is helpful to give students a range; for example, between 7,000 kwh (last month's kwh) and 11,000 (last year's kwh for the same month).

II. Energy Patrol

An energy patrol is made up of a team of students who check classrooms, office areas, portables and storage rooms each recess, at lunch and after school. When lights are found left on, the team members simply turn them off.

The program originated at the DeVargas Elementary School in Cupertino Union School District and has been a popular program replicated in other districts such as Waterford Watt Watchers in a small, rural Central Valley district. In surveys conducted after Energy Action in schools' Staff Development Workshops, energy patrols are the most frequently mentioned activity schools note having adopted.

The following article by Diane Thayer, Categorical Program Coordinator, DeVargas School, was excerpted from the CEES newsletter, *SaveEnergy*, Spring 1982.

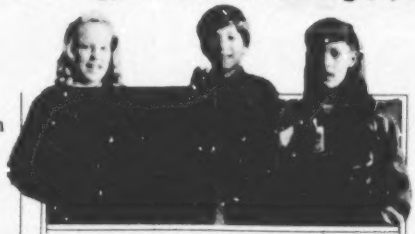
TURN OFF THE LIGHTS!

Here comes the Energy Patrol! ...saving $1,000 per month.

Our DeVargas School Energy Patrol has saved over $3,000 in energy costs in just three months! Sound too good to be true? After a $1,000 saving the first month, we too thought that something must be wrong, but each month as the PG&E bills come in, the results continue to be fantastic.

The DeVargas Energy Patrol is made up of 20 fourth, fifth and sixth graders who check each classroom, the office areas, portables and store rooms at recess, lunch and after school. When lights are found on, they are quickly turned off by this conservation minded group. Periodically thermostats are also checked to see that they stay at an energy saving 65 degrees.

When our principal got the idea of our Energy Patrol, he realized that there needed to be something special about such a group that would attract and motivate fourth, fifth and sixth graders. He went to the Cupertino School District's Associate Superintendent of Business and asked for $100 to use for Energy Patrol start-up expenses. In exchange for the money, he promised that we would save $100 on our utility bill the first month and each month thereafter. With the funds we purchased four jackets that say "DeVargas School Energy Patrol" on the front, and have our symbol, the lightning bolt, on the back. We also got photo identification name tags for each Energy Patrol member. Members wear a jacket and their name tag when they are on duty.



Three veterans of the DeVargas Energy Patrol in San Jose describe their activities to teams of students, teachers, administrators and operations and maintenance people from other schools who attended an Energy Action in Schools workshop in San Rafael, shown in the photograph on p 5.

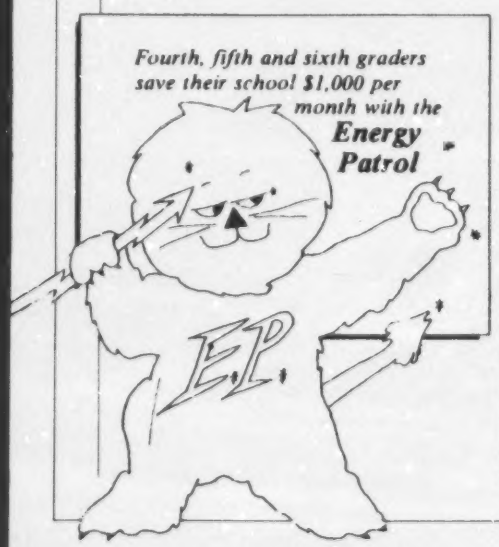
Our Energy Patrol routine is simple—one of our main criteria when we started. The members were recommended by their teachers; good, responsible students that could be trusted with keys to the buildings and who would need little supervision. There is no teacher involvement other than enthusiastic support of the program. Administrative involvement, after initial start up and procedure setting with the Energy Patrol members, is minimal.

Four students are on duty each day. One team of two students checks half the rooms and two check the other half. It now takes them about five minutes. They come to the office where their jackets, name tags and clipboards are kept in one corner of a storeroom. They get into uniform and pick up the keys, which are kept near the secretary's desk in a secret hiding place known only to Energy Patrol members! They do their rounds, keep records of whose lights are on or off, bring back their materials and go to recess. It's easy and quick!

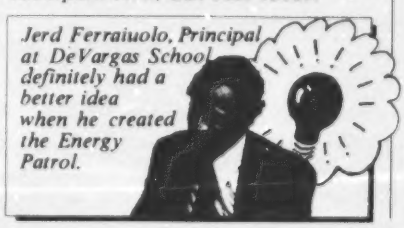
Activities for our Energy Patrol have gone beyond our original plan. This enthusiastic group has increased its awareness of energy conservation and has requested to explore problems they found and to expand their duties. They have made bulletin boards on conservation, put "Save Energy" signs by every light switch, visited PG&E to hear their suggestions for conservation, and performed an air flow study and sent results to the District Office, the results of which led to many new thermostats and some work on the heating system. They have made a School Board presentation and even appeared on TV news. One of the activities, beyond turning off lights, that has most directly helped their conservation activities was their creating a reminder that says "Oops, you forgot to turn off your lights." The little 3×3 piece of paper with the picture of an unhappy lion, our DeVargas mascot, is taped over the light switches that are left on in unused rooms. It has increased the awareness of students and staff. Nobody wants an unhappy lion to remind them that they are not helping in our conservation efforts. Awards are presented at each of our monthly assemblies to classes that have done a good job of turning off their own lights. However, the basic activity of getting lights turned off at recess, lunch and after school and encouraging other students and teachers to do the same is still our basic activity and all that's really necessary for success.

Did we save our $100 the first month? That and more! We have averaged a savings of over $1,000 a month for the months we have been at work. Our electrical usage has been reduced 36% and gas use 40%. Kids can make a difference!

For more information, including start-up and procedure checklists and other forms, write to DeVargas School, 5050 Moorpark Ave., San Jose 95129.



Fourth, fifth and sixth graders save their school $1,000 per month with the ***Energy Patrol***



Jerd Ferraiuolo, Principal at DeVargas School definitely had a better idea when he created the Energy Patrol.

III. Staff Development

When teachers in a district really understand that using energy wisely in their classrooms and teaching their students to identify energy waste can have a substantial impact on their school energy budget — then the energy savings will be great.

This section assimilates workshop evaluation comments from districts who sponsored staff development programs to increase teacher support of district energy management programs. The purpose of these workshops was to provide a forum where speakers from schools with successful energy programs could share their ideas and experiences with representatives from other districts. We hope you will be able to put together staff development programs to generate this understanding and stimulate comments such as:

"It was good to be exposed to new materials on energy. I enjoyed the specifics of our district's energy costs and why they are so high. It makes one aware of how important conservation is in our classrooms." (Comment from 6th grade teacher, Mt. Diablo USD)

To assist you, we have divided our comments into recommendations that address three questions:

1. What workshop activities do teachers like most?
2. What encourages teachers to attend workshops?
3. What is the best time for teacher workshops?

WHAT WORKSHOP ACTIVITIES DO TEACHERS LIKE MOST?

"Workshops usually are a waste of time if what we learn is not applicable to the classroom." (8th grade teacher)

"I find it most helpful to not only be jazzed up, but to have items I can really use without taking three weeks of my time for preparation." (teacher in Stanislaus County)

What gets teachers "jazzed up" at workshops? Teachers are enthusiastic about workshops where they are introduced to relevant information, and are provided with curriculum materials and ideas they could use with their classes the following day.

Energy education/management workshops can easily fit these criteria. School energy use is relevant because it affects the availability of funds for the instructional program, and because staff and students feel the impact at home of rising energy costs. Educating teachers about school energy costs is a first step towards reducing usage.

"I had no idea that so much is spent on energy and how much can be saved by conserving!"

Once teachers are informed about the cost of energy, classroom actions and ready-to-use energy

curriculum materials can be presented. Teachers appreciate having the necessary tools to contribute to saving energy dollars at school and at home. By using classroom follow-up activities, teachers are in the position of making a valuable contribution to their schools' academic program and budget.

Following are some workshop activities rated highly by teachers:

- hands-on activities they can use with their classes;
- participatory activities which demonstrate a skill or method;
- developing teaching tools (i.e., making meter boards);
- introducing a curriculum packet they receive at the end of the workshop;
- demonstrations using equipment available at school, such as light meters and flow volume meters;
- presentations involving students (i.e., student energy patrols);
- participation in practical school audits which show how to save energy/money at school and at home;
- participation in quiz-type contests which didn't require a lot of work and have a prize;
- observing on-site pilot programs; and,
- exchanging ideas with other teachers.

WHAT ENCOURAGES TEACHERS TO ATTEND WORKSHOPS?

It is not necessary or very likely to have every teacher in a school or district enthusiastic about saving energy at school. On any teaching staff, there will be those teachers who are:

Group 1: already interested in energy education/management;

Group 2: unaware of energy education/management, but could become interested if they knew more about it; and,

Group 3: not interested in energy education/management now, and probably never will be.

By organizing the efforts of the first two groups, a school can have a highly successful energy program. The easiest and most sensible way to identify teachers to participate in an energy workshop is to invite teachers who have already demonstrated an interest in energy (group 1). The following techniques have been successful in attracting teachers who would be supportive if they knew more about energy education/management (group 2):

- provide substitutes
- announce the workshop well in advance
- prepare the agenda in advance
- make it fun with refreshments, contests, and door prizes
- keep the meeting short
- orient part of the meeting towards curriculum
- distribute curriculum materials
- feature recognized speakers
- give in-service credit
- pay stipends
- principal recognizes teachers for participation
- let teachers know that their efforts are paying off at school and can pay off at home
- get a contest going between the classes whose teachers attend

WHAT IS THE BEST TIME FOR TEACHER WORKSHOPS?

There is no generalized "best time" of the day for workshops. Districts have successfully held workshops at varying times of the work day as well as during evenings and weekends. Union contracts and financial constraints must be taken into consideration in deciding when to hold workshops. The best approach is to ask the teachers you want to participate what the best time is for them. The following workshop times worked well:

- after school on minimum days because substitutes were not needed and the teachers were a captive audience;
- late afternoons and evenings when a meal or stipend was provided;
- providing substitutes for teachers so they could attend training because teacher attendance is guaranteed and they are not already tired from a full day's work. Elementary teachers especially, may not like to be out of their classroom due to the extra preparation time they have to put in for a substitute;
- half-day workshops with substitutes in the mornings because teachers were fresher.

The best times of the year for workshops appear to be in the early fall, at the beginning of the second semester and, for follow-up workshops, in the early spring. December and June are not good months for workshops. In scheduling, avoid public schools' week, back-to- school night, parent conference, district testing periods, and the end of each term and sports events.

IV. Energy Committees

School staff will support comprehensive energy management programs when they are included in the energy decisions that affect them. Since energy use is an issue that affects all people in a school district, many districts organize district and site energy committees to develop and implement a comprehensive energy management plan. This section describes who typically serves on 1) district and 2) site energy committees and outlines the topics each address.

WHO SERVES ON A *DISTRICT* ENERGY COMMITTEE?

Chair: District person responsible for energy management program

Director of Maintenance & Operations

Associate Superintendent of Business Services

Director of Facilities

Director of Food Services

Board member

PTA President

High school teacher

Elementary school teacher

Energy committee chairperson or principal from each site

Utility representative

Student representative (school newspaper editor, school energy commissioner)

WHAT ARE ACTIVITIES OF *DISTRICT* ENERGY COMMITTEES?

The District Energy committee's three main functions are to:

- recommend energy conservation funding priorities for board approval;
- communicate energy goals and trends in energy use with individual sites; and,
- initiate and coordinate district-wide energy activities such as competitions and contests, staff development and grant applications for energy conservation activities.

The district energy committee chairperson is usually the person responsible for the energy management program. Topics on the agenda at a minimum include:

- monthly energy report, site by site for the district;
- status report on implementation of energy plan;
- reports of activities at each site represented at the meeting (this depends on the size of the committee); and,
- time to troubleshoot specific problems and/or plan the next step in the energy plan.

To give you a flavor of the content of these meetings, we have drawn from the minutes of several school district's energy committees.

"A discussion took place regarding utilizing outside, non-district energy management firms. The consensus of the district energy committee was that the district should totally exhaust all possible low and no-cost forms of retrofittings and energy-saving modifications and receive 100% of the generated savings. Furthermore, it was suggested that if additional money was necessary for essential retrofittings, we pursue the idea of tapping the district's own resources and borrowing from funding within the district, such as a reserve fund, and simply pay back from the savings generated. Such action might necessitate writing a proposal and submitting it to the Board for approval. After all these efforts have taken place, then, and only then, should the committee consider the necessity/advisability of assistance from outside firms."

Examples of Communicating Energy Goals and Activities:

October gas and electric usage compared to last year represents a $12,595 cost-avoidance savings. This savings is attributed to a 36% and 11% reduction in gas and electricity respectively. Please share this information with your staff and community.

Energy conservation projects currently underway in the district include:

1. Participation in a PG&E lighting conversion refund program which provides up to a 50% rebate for replacement of incandescent lighting with flourescents. There remain approximately 600 incandescent lamps in the district. Most of these will be replaced by January 15th through the PG&E conversion refund program.
2. Redwood and Silverado gymnasiums will be relamped from incandescent to high-pressure sodium lighting, which is the most energy-efficient lamp on the market. This project is being funded by a federal matching grant.

Example of staff development discussion:

"Six three-hour in-service training sessions have been planned for our site energy coordinators. The first sessions was held November 22nd with all but two schools represented. These monthly sessions are designed to equip our site coordinators to disseminate energy conservation ideas and materials within your school. They are receiving a $30 stipend for attending each of the workshops."

"Bob reported on plans for a custodial energy in-service meeting to be held on February 25th. The purpose will be to introduce the custodial staff to what they can do to help conserve energy."

"Recognizing the crucial role that school plan managers play in the school site conservation program, it was recommended that they be provided energy management in-service for the 83-84 school year. Hopefully, in- service credits could be made available. Al and Pat will give this suggestion further study and consideration."

Examples of incentives programs discussion:

"Committee members then expressed opinions and ideas regarding ways the incentive component should be administered as additional schools officially enter the conservation program. Several thoughts were expressed:

1. The 1982-83, 25%-75% incentive proposal should be reconsidered. A possible revisions might be to return 25% (or less) to the school site for energy conservation retrofittings and put the remaining 75% into a district 'conservation pool' to be used where most appropriate . . . i.e., where maximum savings can be achieved in a relatively short pay-back period.
2. It was suggested the committee develop a process/procedure wherein savings that retrofitting and equipment modification generate be separated from savings that changes in people's attitudes and habits generate; hence, end of year 'cost avoidance' monies will be distributed equitably. For example, if the high schools have pool covers installed, there would be a savings of approximately $70,000. This money would be put into the district's conservation pool rather than returned to personnel at the school site.
3. A suggestion was made to tap the student resources of nearby colleges and universities for current suggestions on energy management techniques."

WHO SERVES ON THE *SITE* ENERGY COMMITTEE?

The site energy coordinator
Principal (of day and night school)
Head custodian/Plant manager (day and night)
Student representative
  suggested students include:
  student council member
  club presidents
  elementary: one from primary and one from intermediate
  middle or high school: one from each grade level, class officers
PTA representative
Parent
Outside Users
Cafeteria Manager
Teachers
  suggested teachers include:
  elementary: one from primary, one from intermediate
  middle or high school:
    science teacher
    dept chairpersons
    student body advisor
    energy advocate

WHAT ARE THE ACTIVITIES OF THE *SITE* ENERGY COMMITTEE?

The site energy committee is responsible for communicating district-wide energy goals and activities to staff and students. To do this they:

- suggest and recommend energy conservation priorities to the principal
- communicate school energy use to staff and students
- coordinate school-wide energy projects such as energy patrols, energy contests, and provide curriculum for teachers
- determine how to use incentive money if the district has an inentives program

Site level energy committees are usually chaired by the site energy coordinator who might be a teacher, the principal or a plant manager. Topics usually include:

- the monthly energy use report and how to communicate results to staff and students
- report of progress or energy retrofits
- report on completed awareness activities and planning for upcoming awareness activities for staff and students
- troubleshooting specific energy-related problems
- discussion of staff development opportunities available or desired.

Here are some accounts from the minutes of Site Energy Committee meetings:

"The Jr. High School Energy Committee held it's first meeting. Staff members, our custodian, parents and students met to develop a plan for our school to conserve energy. The Unified School District has a goal of 10% reduction in energy costs for each school. Hill has reduced it's energy consumption by 25% thus far compared to last school year. The committee created a plan of action to spread the word to all who share our campus that energy conservation is on important way to save money that we would rather spend on educational materials and programs."

"Each school has set up an energy team to develop energy ac-

tion plans. Some ideas being suggested (gleaned from minutes):

- charts on energy output, graphing percentage increase and decrease (Rancho, Lynwood)
- poster/composition contests (Rancho, Hill, Lynwood)
- student energy patrols to read meters, check on lights (Novato High, Rancho)"

"In addition to the school site committee, a student Energy Watch Dog Team has been created. The team consists of three students, who will do a monthly audit. Additionally, each classroom has an energy monitor with a daily checklist. Large charts showing gas and electrical savings are displayed in the cafeteria. Energy usage guessing contest, public speaking, and poster contests have been held. Oscar was pleased to report a 54% reduction in gas use during the month of October; November, 3% savings; electricial savings have been running around 20% to 30%."

"Jim, Custodial Manager, reported the School Energy Committee meets first period with representatives from each room. They are designing posters and charts which will be placed in strategic places throughout the school. An energy chart has been developed which will show monthly entries. Each department is going to undertake an energy conservation activity. Assemblies have been formed. Plant manager has tried a variety of conservation activities, including "coasting" (turning heat down earlier), and using red dots on light panels that have been turned off and/or removed that calls attention toward conservatio steps. The dots also alert other custodial help that they don't have to replace that light as it has been turned off for conservation reasons. Jim added he has returned to the school site at night time and found much unnecessary lighting was taking place. Steps are being taken to improve this. The school also used red dots to mark which lights are to be turned on at night (to alleviate any question and uncertainty). Jim is working with the night crew on energy conservation. He has changed corridor lights from 100 to 45 watts."

ENERGY CONSERVATION COMMITTEE

Minutes of Meeting held December 6, 1982 at 3:00 P.M. at Lynwood School.

Present: Suzanne, teacher; Nadine, custodian; Matt, student; and Donald, principal.

Background information on Energy Conservation in the U.S.D. was given to the group by Don.

The following suggestions for improvement of Energy Conservation at school was given by the E.C.C. at school:

1. Energy consumption report to be given to students and teachers monthly.
   a. Students could make charts and graphs showing changes in consumption.
   b. Students could make posters encouraging conservation of resources.
2. Thermometers are to be purchased for each room.
   a. Comparisons could be made between indicated temperature and temperature on classroom thermometer.
3. Repair broken thermostats in classrooms.
   a. Replace broken covers on thermostats.
4. Check with PG&E for actual light level needed in classrooms. p6a. Calculate amount of electricity consumed per hour with 9- 750 watt lamps in each room.
   b. Check on avialability and cost of dimmer switches for classroom lighting.
   c. At recess time with an aide left in room with few students, cut lights to one bank only.
5. Have PG&E calculate the amount of electricity and gas consumed by the district kitchen at Lynwood.
   a. Encourage Food Service to serve one cold lunch per week.
6. Have district maintenance pull a sampling of furnace filters to see what condition they are in. If dirty, have them replaced.
7. Separate aluminum foil in Multi-Use room at lunch time.
   a. Recycle and use money for school fund which would benefit all students.
8. Recycle all used ditto paper.
   a. Storage might be a problem.
9. Students and teachers are to be encouraged to shut off faucets that are dripping.
   a. Report needed repairs to the office.
10. A sampling of 4th, 5th, and 6th grade students will be given an energy conservation survey on Friday, December 10 at 9:00 A.M. in the Lynwood Library.
11. Charles, District Energy Coordinator, will talk to staff on January 19th.

Energy Action

During 1981-82 ENERGY ACTION IN SCHOOLS (EAIS) contracted with California School districts to develop and implement model energy education and energy management programs that reduced school energy consumption by 10-12% and increased student and staff understanding of how energy is used in schools.

McKinleyville/Humboldt County
DOW'S PRAIRIE SCHOOL
McKinleyville Union School District
1st-6th *(See page 14.)*

Overview:
Students monitored classroom energy use, conducted classroom energy audits and developed a school energy awareness campaign. An incentives program returned 10% of the savings to use for energy education projects.

Outcomes:
- School energy education program with special emphasis on programs for the gifted, career education, and science
- Energy workshops for staff
- Teacher designed curriculum packets to infuse energy into all classes
- Incentives program
- Energy fair
- Energy page in school newspaper for distribution to the community.

Cupertino/Santa Clara County
CUPERTINO ENERGY ACTION PROJECT
Cupertino Union School District
K-8th *(See page 10.)*

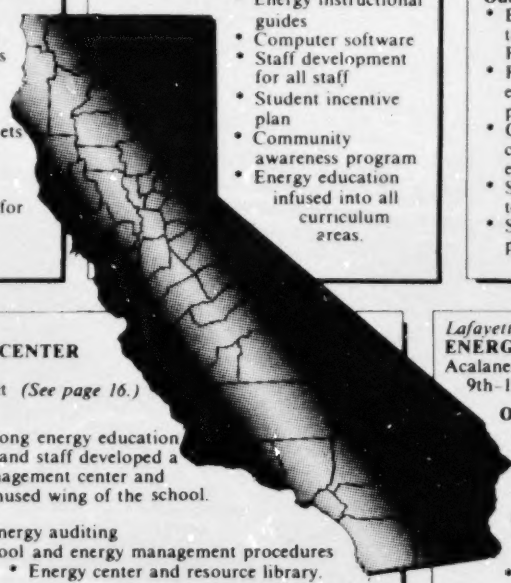
Overview:
Students initiated a school-wide effort to reduce energy consumption to complement the district management program.

Outcomes:
- Energy instructional guides
- Computer software
- Staff development for all staff
- Student incentive plan
- Community awareness program
- Energy education infused into all curriculum areas.

Pollock Pines/Sacramento County
SLY PARK AUDITING FOR CONSERVATION OF ENERGY
Sacramento County Office of Education
5th-6th *(See page 18.)*

Overview:
Students monitored their cabin's energy use during their five day stay at Sly Park to learn how their actions influence energy use.

Outcomes:
- Energy Education In-service for teachers whose classes come to Sly Park
- Pre and post energy education/management curriculum packets for classroom teachers
- Comprehensive energy education curriculum for residential environmental education program
- Staff development for residential teachers
- Student incentive programs to promote energy management.



Hayward/Alameda County
SUNSET ENERGY EDUCATION CENTER
Sunset High School 9th-12th
Hayward Union High School District *(See page 16.)*

Overview:
Students participated in a semester long energy education energy management class. Students and staff developed a model energy education/energy management center and resource library and retrofited an unused wing of the school.

Outcomes: • Students trained in energy auditing
- Energy efficient "wing" at the school and energy management procedures
- Work/learn energy curriculum • Energy center and resource library.

Lafayette/Contra Costa County
ENERGY WATCH
Acalanes Union High School District
9th-12th *(See page 6.)*

Overview:
Fifty students were trained as energy auditors and received job interview training during a semester-long class at four high schools.

Outcomes:
- Curriculum for energy auditor training class
- Energy audits of four elementary schools
- Community energy presentations by students
- Energy exhibits at Acalanes District International Faire
- Students teaching students about energy management.

Los Angeles/Los Angeles County
BERENDO ENERGY SAVING TEAM (BEST)
Los Angeles Unified School District 6th-8th *(See page 8.)*

Overview:
"Think Energy" a school-wide campaign publicized ways students and community can conserve energy and an energy education program stranded energy into all subject areas.

Outcomes:
- Energy management reporting system
- School energy-use chart
- Subject area energy packets
- Bi-lingual energy conservation videotapes for closed circuit TV and public access channel
- Incentives program.

La Mesa/San Diego County
STUDENT AND STAFF ACTIVITIES TO VALUE ENERGY (SAVE)
Grossmont Union High School District
9th-12th *(See page 12.)*

Overview:
Students and staff developed school energy management plans to reduce energy use and return saved energy dollars to the school. Staff reviewed energy education materials and designed a program for local use that emphasizes energy management in the school, the home, and the community.

Outcomes:
- District-wide incentives program
- District energy education program
- Staff development.

California Energy Extension Service

State of California
George Deukmejian, Governor

Energy Action in Schools

Model Programs for 1982-83

EAIS staff work with school districts to integrate energy management programs with energy education to achieve the immediate goal of reducing escalating school energy costs and the long-term goal of developing an energy use ethic in students and staff.

The unique emphasis of the EAIS program is on involving everyone at the school — administrators, board members, teachers, maintenance and operations staff, custodians, and the students — in programs that encourage the wise use of energy.

In addition to the eight model programs for 1982-83 described here, EAIS has funded eight Staff Energy Action Projects (max. $2,500) to provide in-service in energy education and management skills for school personnel. Schools receiving contract awards include the Bella Vista Elementary School District, Mt. Diablo Unified School District, San Juan Unified School District, Los Altos Elementary School District, Round Valley Unified School District, and the Stanislaus County Department of Education.

Sacramento County

SAVE (Sacramento Awareness of Value of Energy)

Sacramento Unified School District, P.O. Box 2271, Sacramento CA 95810. (916) 454-8537. Grades K-8. $14,000. Contact Patricia Smith.

Overview: A district-wide program will be piloted this year. Students will learn energy conservation practices they can apply at home and at school. Energy education will be infused into major subject areas. Staff will participate in energy awareness staff development.

To Be Produced:

- Description of student incentives program
- Comprehensive district-wide energy education plan
- Computer energy education software
- Staff development models for principals, central staff, board members, teachers, custodians, food service employees and clerical personnel. ☑

Napa County

SENSE (Saving Energy in Napa Schools is Essential)

Napa Valley Unified School District, 2425 Jefferson St., Napa CA 94558. (797) 252-5278. Grades K-12. $15,000. Contact Phil Moreno.

Overview: A teacher energy coordinator in each school will receive instruction in 6 three-hour workshops on how to work with staff and students to monitor school energy use and infuse energy education into the curriculum. Elementary students will participate in hands-on projects and become pen pals with students in other districts with energy management programs. Secondary students will construct a district energy resource center. The computer classes will generate a monthly energy reporting form for use by the district energy manager. A district-wide white paper recycling program will be implemented.

To Be Produced:

- District-wide energy curriculum for infusion
- Student-developed energy data computer program for use by energy manager
- Energy education resources library and "tool kits" for student projects
- Student energy projects
- How to set up an energy pen pal exchange. ☑

Los Angeles County

ESP ENERGY SAVINGS PLAN

Venice High School, Los Angeles Unified School District, 13000 Venice Blvd., Los Angeles, CA 90066 (213) 306-7981. Grades 10-12; $14,500. Contact Pricilla Lee or Millie Anderson.

Overview: An energy committee will be formed representing the 9-12th day school, the adult school and the continuation school to ensure energy reduction throughout the day. Students will read meters in the morning and evening to monitor energy use. Staff will receive inservice on how to infuse energy education into their classes and reduce energy use in their classrooms and homes. The computer classes will develop energy education software. An energy fair will be held to increase student and community awareness.

To Be Produced:

- Energy education software
- Description of how to add an energy component to a high school science fair
- Infusion plan for energy education
- Survey form for monitoring home energy use
- Staff energy in-service model. ☑

California Energy Extension Service

Marin County

EM + EE = EC

Novato Unified School District, 1015 Seventh St., Novato, CA 94947. (415) 897-4201. Grades K-12. $9,500. Contact Paul Mobley or Charles Johnson.

Overview: The school site energy teams will be trained to monitor energy use and make energy conservation recommendations. The maintenance and custodial crews will receive training on preventative maintenance. The district energy committee will receive extensive training in the fall and spring to develop comprehensive energy conservation plans and to infuse energy into the curriculum.

To Be Produced:

- Monthly energy newsletter for distribution to school and community
- Energy education resource library
- Staff development plan
- Written criteria for selecting energy education materials. ☑

Mendocino County

ENERGY CURRICULUM MANAGEMENT WITH COMPUTER BOOKLET OUTREACH

Arena Union Elementary and High School Districts, 200 Lake St., P.O. Box 136, Point Arena, CA 95468. (707) 882-2803. Grades K-12. $10,000. Contact Art Sussman.

Overview: Elementary students will serve on an energy patrol with junior high students, collecting energy data and sponsoring contests. High school students will participate in an energy club to monitor energy use in rooms, disseminate energy information and actually help carry out site energy management projects. Junior and senior high students will produce a booklet that documents energy conservation and education activities at the schools and describes how to save energy at home. Students and teachers will develop energy related computer software.

To Be Produced:

- School and home energy conservation booklet
- Energy-related computer software
- Description of how to incorporate energy education into driver's education. ☑

Alameda County

SITE ENERGY COMMITTEES

Fremont Unified School District, 40775Fremont Blvd., Fremont, CA 94538. (415) 657-2350, ext. 288. Grades K-12. $15,000Blake Heitzman or Gil Yee.

Overview: Teacher site energy coordinators will participate in a 15 session training program. The district energy coordinator will also work one-to-one with teachers to demonstrate and co-teach energy education lessons. Energy education materials will be infused throughout the curriculum.

To Be Produced:

- Training materials package for teacher energy coordinators
- Manual for implementing an incentives, rebate plan
- Paper describing procedure for establishing teacher training course for college credit. ☑

Placer County

ENERGY-WISE, PENNY-WISE

Newcastle Elementary School District, P.O. Box 197, Newcastle, CA 95658. (916) 663-3307. Grades K-8. $6,900. Contact Jeanita Ives.

Overview: Students will present an energy conservation-education plan to their school board, participate in a school energy week to learn where energy is used and how it can be conserved, continually monitor school and home energy use, and visit energy efficient businesses in the community. The custodial and cafeteria staff will share with students what they are doing to conserve energy. Students will design and write a book on energy conservation for kids and develop an energy film or videotape. The annual science fair will include an energy division.

To Be Produced:

- Energy patrol
- An illustrated book by kids for kids on how to conserve energy at school and in the community
- An energy drama film for showing to the school and community
- School-wide energy plan
- Description of how to add an energy component to a science fair. ☑

Stanislaus County

WATERFORD WATT WATCHERS

Waterford Elementary School District, P.O. Box 270, Waterford CA 95386 (209) 874-2382. Grades K-8. $3,885. Contact Kim Wilkins.

Overview: Through a weatherization training program students, staff and parent volunteers will weatherize the classrooms at the schools. A district awareness campaign will be conducted and a resource file of curriculum materials will be compiled. Students and staff will present their program at the Stanislaus County Office of Education's Spring Mini-conference.

To Be Produced:

- Student energy patrol
- Description of classroom weatherization activities for students
- Articles for local newspapers
- Proposed district-wide energy plan. ☑

78270-725 3/84 4M OSP